
Space Weather Forecast

Issued on Thursday, 17 March 2022 at 12:30 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales <https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales>

Space Weather Forecast Headline: Chance of isolated M-flares. Slight chance of G1 minor geomagnetic storms on day 4 (20th March).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar Activity has been Low with one common class flare. There are currently three numbered sunspot regions on the visible disc. The larger, more complex region located in the northwest quadrant, a further group consists of a single, small unipolar spot in the northeast quadrant. The new region in the northeast has been numbered but looks weak and stable.

Two filament eruptions and subsequent CMEs were observed on the UTC afternoon on 16th. The first is a clear miss however a filament eruption from the east may give a glancing blow on the 20th March. No other Earth-directed CMEs were observed in available imagery.

Solar Wind / Geomagnetic Activity: Solar winds have been slowly declining from slightly elevated to background levels. The magnetic field carried by the winds has been weak, with the north-south directed component becoming largely negative (southward), although also weak. Geomagnetic activity has been Quiet.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at background with no solar radiation storms occurring.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to be at mostly Low or Very Low levels with an ongoing chance of an isolated M-class flare, mainly from the large region in the northwest of the disc.

Solar Wind / Geomagnetic Activity: There is one slow weak CME observed from the south of the Sun on 13 March. This will likely pass below Earth, but may give a glancing impact on day 1 (17th). The filament eruptions and subsequent CMEs from the northeast quadrant on 16th have been modelled in Enlil. The CME off the west limb is a clear miss, but the CME from the filament eruption in the east may give a glancing blow on day 4 (20th March). Also, the next potential coronal hole fast wind arrival is likely to be on day 4 (20th March) from CH66/-, a northern extension of the southern crown coronal hole. Geomagnetic activity is expected to be mostly Quiet with occasional Unsettled intervals until day 4 when there is an increased likelihood of Active intervals and a chance of G1 minor geomagnetic storms.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to be at background levels with no solar radiation storms, although there is a slight chance of an increase in response to any larger flares that may occur.

Geomagnetic Storms:

Geo-Magnetic Storm	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Minor or Moderate	G1 to G2	No	5	1	1	30
Strong	G3	No	1	1	1	2
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability			(%)	(%)	(%)	(%)
Active	R1-R2 M Class	No	25	25	25	25
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms	Level (cm ⁻² sr ⁻¹ s ⁻¹)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = cm⁻²sr⁻¹s⁻¹)